Lower Colorado River Multi-Species Conservation Program

Balancing Resource Use and Conservation

Palo Verde Ecological Reserve

2017 Annual Report

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

September 2018

Work conducted under LCR MSCP Work Task E4

Lower Colorado River Multi-Species Conservation Program Steering Committee Members

Federal Participant Group

Bureau of Reclamation
U.S. Fish and Wildlife Service
National Park Service
Bureau of Land Management
Bureau of Indian Affairs
Western Area Power Administration

Arizona Participant Group

Arizona Department of Water Resources
Arizona Electric Power Cooperative, Inc.
Arizona Game and Fish Department
Arizona Power Authority
Central Arizona Water Conservation District
Cibola Valley Irrigation and Drainage District
City of Bullhead City
City of Lake Havasu City
City of Mesa
City of Somerton
City of Yuma
Electrical District No. 3, Pinal County, Arizona
Golden Shores Water Conservation District
Mohave County Water Authority
Mohave Valley Irrigation and Drainage District
Mohave Water Conservation District
North Gila Valley Irrigation and Drainage District
Town of Fredonia
Town of Thatcher
Town of Wickenburg
Salt River Project Agricultural Improvement and Power District
Unit "B" Irrigation and Drainage District
Wellton-Mohawk Irrigation and Drainage District
Yuma County Water Users' Association
Yuma Irrigation District
Yuma Mesa Irrigation and Drainage District

Other Interested Parties Participant Group

QuadState Local Governments Authority
Desert Wildlife Unlimited

California Participant Group

California Department of Fish and Wildlife
City of Needles
Coachella Valley Water District
Colorado River Board of California
Bard Water District
Imperial Irrigation District
Los Angeles Department of Water and Power
Palo Verde Irrigation District
San Diego County Water Authority
Southern California Edison Company
Southern California Public Power Authority
The Metropolitan Water District of Southern California

Nevada Participant Group

Colorado River Commission of Nevada
Nevada Department of Wildlife
Southern Nevada Water Authority
Colorado River Commission Power Users
Basic Water Company

Native American Participant Group

Hualapai Tribe
Colorado River Indian Tribes
Chemehuevi Indian Tribe

Conservation Participant Group

Ducks Unlimited
Lower Colorado River RC&D Area, Inc.
The Nature Conservancy

Lower Colorado River
Multi-Species Conservation Program

Palo Verde Ecological Reserve

2017 Annual Report

Prepared by:

Andrea Finnegan, Restoration Group

Barbara Raulston, Wildlife Group

Becky Blasius and Jimmy Knowles, Adaptive Management Group

Lower Colorado River
Multi-Species Conservation Program
Bureau of Reclamation
Lower Colorado Region
Boulder City, Nevada
http://www.lcrmscp.gov

September 2018

Finnegan, A., B. Raulston, B. Blasius, and J. Knowles. 2018. Palo Verde Ecological Reserve, 2017 Annual Report. Lower Colorado River Multi-Species Conservation Program, Bureau of Reclamation, Boulder City, Nevada.

ACRONYMS AND ABBREVIATIONS

CDFW	California Department of Fish and Wildlife
COB	confirmed breeding territory
FY	fiscal year
LCR MSCP	Lower Colorado River Multi-Species Conservation Program
lidar	light detection and ranging
POS	possible breeding territory
PRB	probable breeding territory
PVER	Palo Verde Ecological Reserve
PVID	Palo Verde Irrigation District
Reclamation	Bureau of Reclamation

CONTENTS

Page

Tables

Figures

1.0 INTRODUCTION

This purpose of this annual report is to summarize all activities that have occurred at the Palo Verde Ecological Reserve (PVER) from October 1, 2016, through September 30, 2017, which is Federal fiscal year (FY) 2017. Water usage is presented for the calendar year, January 1 through December 31, 2017, consistent with the Colorado River Accounting and Water Use Report: Arizona, California, and Nevada, Calendar Year 2017 (Bureau of Reclamation [Reclamation] 2018).

1.1 Background

The PVER encompasses 1,352 acres of the historical flood plain of the Colorado River near Blythe, California. Formerly, the property was known as the Riverview Ranch and was owned by the Travis family. The ranch was acquired by the Trust for Public Lands in 2004 to offset degradation of wildlife habitat along the lower Colorado River. On September 3, 2004, the property was conveyed to the State of California. The State identified up to 1,300 acres of active agricultural lands on this property for habitat restoration under the Lower Colorado River Multi-Species Conservation Program (LCR MSCP), a 50-year multi-partner program administered by Reclamation (LCR MSCP 2004).

The California Department of Fish and Wildlife (CDFW) and the LCR MSCP jointly planned the conversion of portions of the PVER from agricultural crops to a mix of native plant species. Now that planting is completed, the created habitats will be managed for species covered under the LCR MSCP throughout the 50-year life of the program. Existing infrastructure consists primarily of an irrigation system comprised of 9.2 miles of lined and unlined irrigation ditches and associated slide gates, a 100-horsepower electric pump, and approximately 14 miles of access roads. All the acreage had been in agricultural crops—grain, small melons, and alfalfa—since the late 1930s.

2.0 CONSERVATION AREA INFORMATION

2.1 Purpose

The purpose of the development of the PVER was to convert 1,023 acres of agricultural land to riparian habitat that will be managed for southwestern willow flycatchers (*Empidonax trailli extimus*) and other LCR MSCP covered species that utilize the Fremont cottonwood-Goodding's willow (*Populus fremontii-Salix gooddingii*) (hereafter cottonwood-willow) and honey mesquite (*Prosopis glandulosa*) land cover types.

2.2 Location

The PVER is located in Reach 4, in southeastern Riverside County, California, approximately 5 miles north of Blythe. It is within the historic flood plain of the lower Colorado River and between River Miles 128 and 134 (figure 1).

2.3 Landownership

The PVER is owned by the CDFW, which has dedicated 1,023 acres for the restoration and maintenance of native land cover types by the LCR MSCP. The CDFW manages two parcels for migratory waterfowl and upland game.

2.4 Water

The Palo Verde Irrigation District (PVID) has an entitlement to Colorado River water for use on up to 104,500 acres of land within the PVID pursuant to a contract between the United States and the PVID dated February 7, 1933. The CDFW, as a landowner within the PVID, has the right to order Colorado River water from the PVID for pumping through the PVID canal system to its fields. The CDFW has made Colorado River water available for irrigation of the native plants.

2.5 Agreements

A Land Use Agreement was signed in 2007 by Reclamation and the CDFW to secure land and water for the PVER for the remainder of the 50-year LCR MSCP. The agreement outlines the rights and responsibilities of each partner in the project's development and maintenance.

2.6 Public Use

The CDFW has the authority, and is the lead, to regulate hunting and recreation uses pursuant to CDFW statutes, regulations, and policies at the PVER. In cooperation with Reclamation, the CDFW coordinates its public use and related activities so they are compatible with management of the site for the LCR MSCP. Low-impact public uses, such as wildlife watching, sport fishing, and education/ outreach, are expected at the PVER; however, these uses may be regulated depending on future occupation of the habitat by listed species.

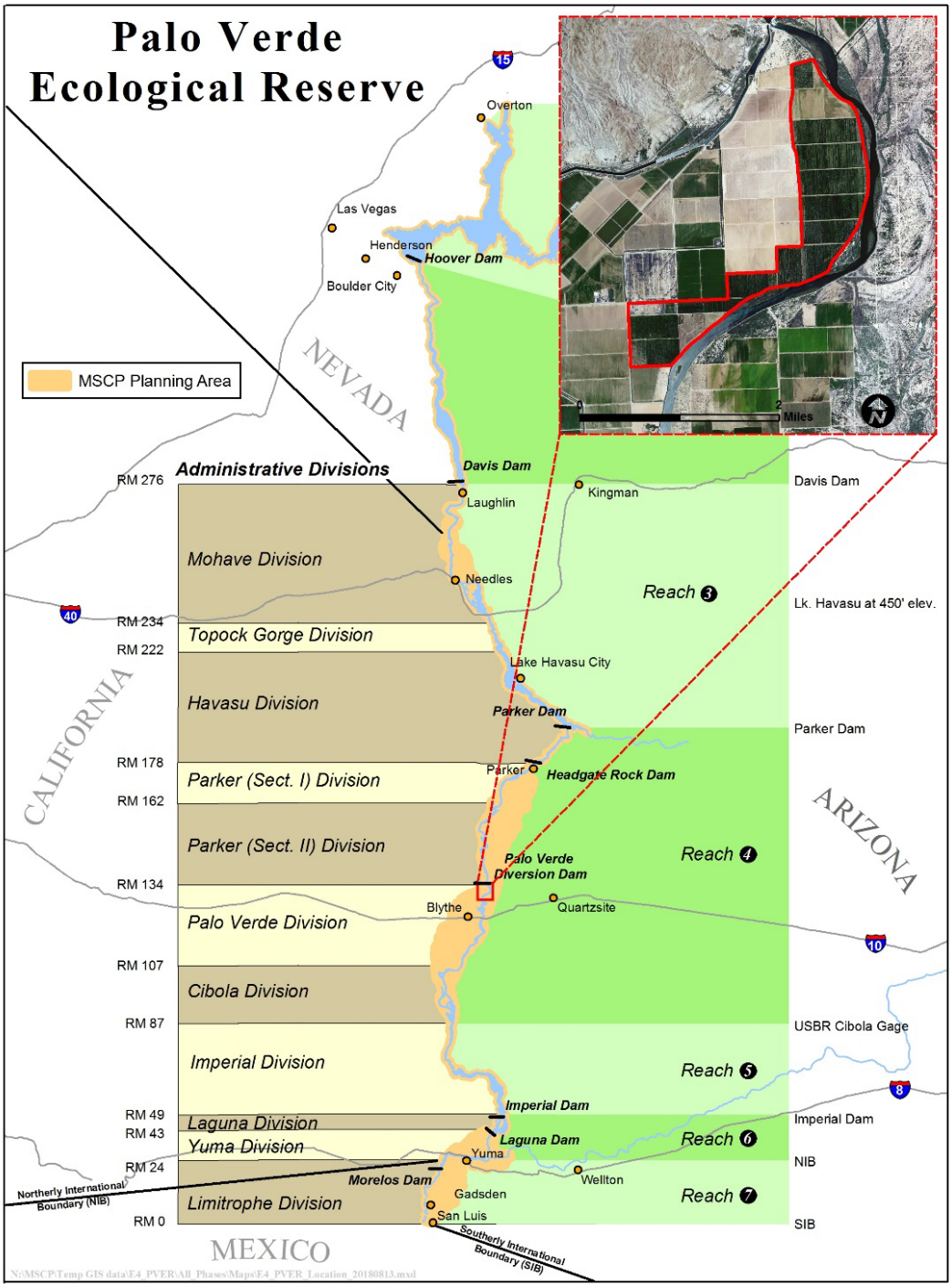


Figure 1.—PVER location map.

2.7 Law Enforcement

The CDFW is responsible for law enforcement at the PVER. A LCR MSCP Conservation Area Specific Fire Management & Law Enforcement Strategy was finalized for the PVER (LCR MSCP 2010).

2.8 Wildfire Management

A LCR MSCP Conservation Area Specific Fire Management & Law Enforcement Strategy has been finalized for the PVER and is posted on the LCR MSCP Web site. The LCR MSCP will continue to work with local State and Federal fire agencies to reduce the risk of wildland fire and to maintain clear lines of communication among agencies.

3.0 HABITAT DEVELOPMENT AND MANAGEMENT

Riparian land cover types were created at the PVER from 2006 to 2013 and are being managed for LCR MSCP covered species (figure 2).

3.1 Planting

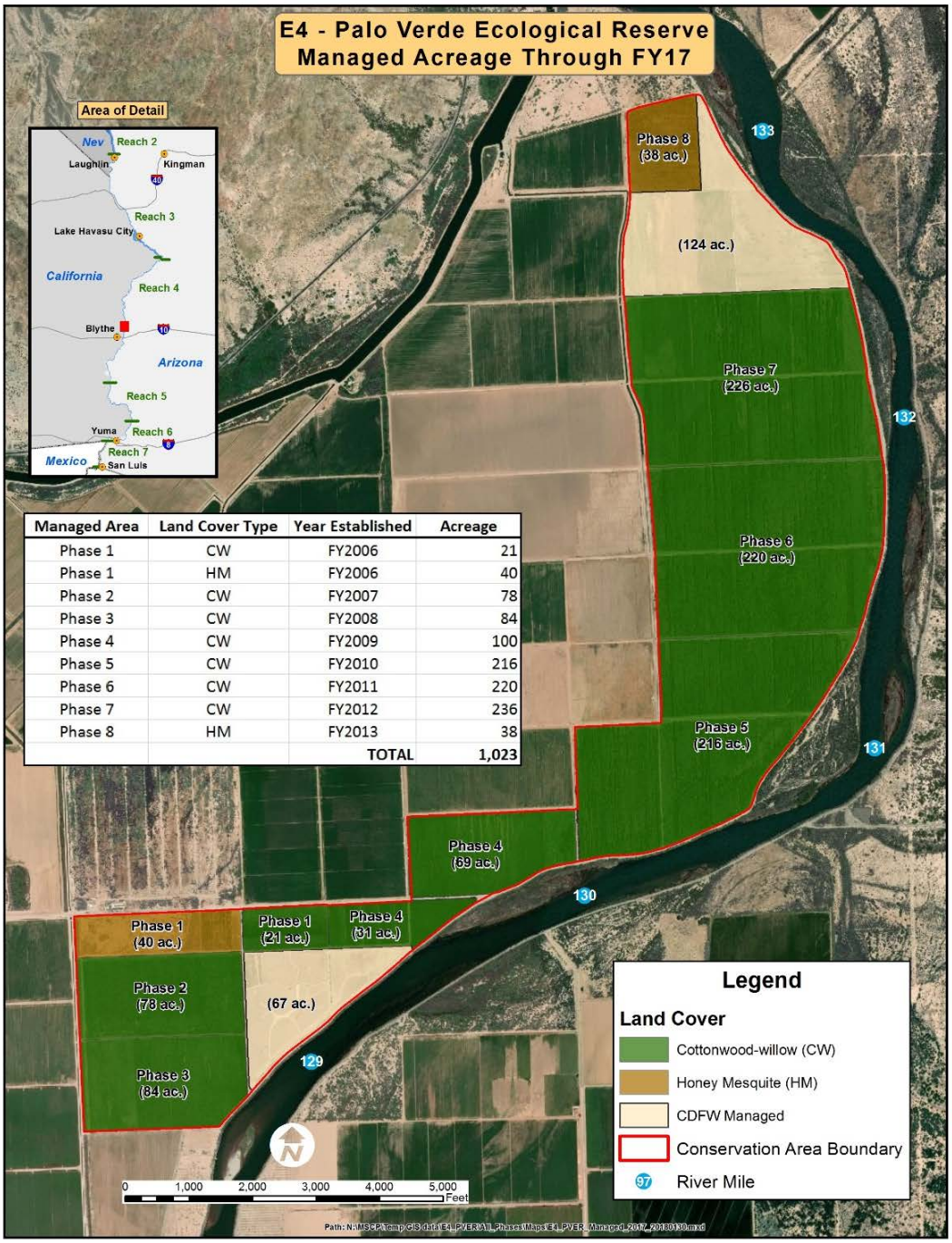
No planting occurred at the PVER in 2017.

3.2 Irrigation

The fields at the PVER are flood irrigated. Water usage for the PVER for the calendar year is reported from the PVID's Water Order System. During 2017, 16,852.71 acre-feet (16.47 acre-feet per acre, per year) of water was applied to the fields at the PVER. The water usage reported by the PVID does not reflect consumptive use or unmeasured return.

3.3 Site Management

Normal road maintenance, such as grading and gravel road base replacement, was done as needed.



Managed Area	Land Cover Type	Year Established	Acreage
Phase 1	CW	FY2006	21
Phase 1	HM	FY2006	40
Phase 2	CW	FY2007	78
Phase 3	CW	FY2008	84
Phase 4	CW	FY2009	100
Phase 5	CW	FY2010	216
Phase 6	CW	FY2011	220
Phase 7	CW	FY2012	236
Phase 8	HM	FY2013	38
		TOTAL	1,023

Figure 2.—PVER managed acreage through FY17.

3.3.1 Weed Management

Invasive weeds and plant material were removed adjacent to the irrigation ditches to protect their integrity. Disking was done quarterly along the levee road and extended 50 feet into the fields to protect the integrity of the road and to reduce the risk of fire.

3.3.2 Pest Management

No pest management at the PVER was needed this year.

3.3.3 Nursery Management

No plant materials were collected from the nursery.

4.0 MONITORING

4.1 Avian Monitoring

Avian monitoring in FY17 included surveys for southwestern willow flycatchers, yellow-billed cuckoos (*Coccyzus americanus occidentalis*), and riparian breeding birds.

4.1.1 Southwestern Willow Flycatcher Surveys

Surveys to detect the presence of southwestern willow flycatchers were conducted five times during FY17 in cottonwood-willow habitat. No breeding or resident southwestern willow flycatchers were detected. Migrant willow flycatchers (*Empidonax trailli*) were detected in May and June. Most birds detected after June 24 or individuals detected repeatedly before June 24 are considered to be southwestern willow flycatchers. Birds detected before June 24 and those detected only once after June 24 are considered to be migrant willow flycatchers (McLeod et al., *in press*).

4.1.2 Yellow-billed Cuckoo Surveys

Four surveys for yellow-billed cuckoos were conducted within the riparian portion of the PVER. During the first survey period (June 15 – June 30), there were 23 cuckoo detections. Two surveys are conducted during the second survey period (approximately July 1 – July 31) and resulted in 76 detections. Between approximately August 1–15, there were 38 detections.

Breeding was confirmed at the PVER in FY17. Due to the behavior of this species, detections alone do not indicate the number of cuckoos present, nor do

detections confirm breeding. The number, timing, and location of detections, along with behaviors observed, may be used to estimate abundance, distribution, and/or breeding status. The possible (POS), probable (PRB), and confirmed (COB) counts were used to estimate the number of breeding territories and not the number of breeding pairs. Territory estimates represent two adults associated with a single nest. There were 25 COB territories, 10 PRB territories, and 14 POS territories breeding at the habitat conservation area in FY17. Nineteen nests were found incidental to surveys (Parametrix, Inc., and Southern Sierra Research Station 2018).

4.1.3 General Bird Surveys

Bird surveys were conducted to detect breeding LCR MSCP riparian bird species and other territorial riparian bird species. Surveys were conducted within areas of the cottonwood-willow and honey mesquite land cover types that were of adequate growth to support breeding birds. General bird surveys resulted in the detection of 19 species (125 territories) of birds breeding within the surveyed plots. Arizona bell's vireos (*Vireo bellii arizonae*), Sonoran yellow warblers (*Dendroica petechia sonorana = Setophaga petechia sonorana*), and summer tanagers (*Piranga rubra*) were confirmed breeding (SWCA Environmental Consultants 2018).

Table 1 shows the number of breeding territories of LCR MSCP covered species (SWCA Environmental Consultants 2018).

Table 1.—Number of breeding territories per LCR MSCP covered species[1] at the PVER, FY17

LCR MSCP covered species	Number of confirmed breeding pairs
Arizona bell's vireo	1.75
Sonoran yellow warbler	1.5
Summer tanager	1.75

[1] Number of breeding territories refers to the number of territories that are within the sampled area for pairs that were confirmed breeding. Partial territories are possible, as the amount of each territory within the sampled area was estimated to 0.25, 0.5, 0.75, or 1.0.

4.2 Small Mammal Monitoring

4.2.1 Bat Monitoring

Acoustic and capture survey methods were used to monitor bats in order to document the presence of species using the PVER and to determine the age, sex, and reproductive status of bats that were captured.

4.2.1.1 Acoustic Surveys

Two long-term monitoring stations were operated at the PVER during June, July, and August 2017. Western red bats (*Lasiurus blossevillii*), western yellow bats (*Lasiurus xanthinus*), and California leaf-nosed bats (*Macrotus californicus*) were detected (table 2). Table 2 summarizes the total number of nights the four LCR MSCP species were detected in FY17 (Mixan and Diamond, *in press*).

Table 2.—LCR MSCP bat detections by month at the two PVER long-term monitoring stations, FY17

Month	Number of nights recorded (PVER 1 / PVER 2)	Total nights detected							
		Western red bat		Western yellow bat		California leaf-nosed bat		Pale Townsend's big-eared bat[1]	
		PVER 1	PVER 2	PVER 1	PVER 2	PVER 1	PVER 2	PVER 1	PVER 2
June	30/0	25	0	6	0	0	0	0	0
July	31/12	19	1	21	0	3	0	0	0
August	31/31	28	3	27	4	5	0	0	0

[1] Genetic analyses on the pale Townsend's big-eared bat indicate that the lower Colorado River is likely in the range of the Pacific Townsend's big-eared bat (*Corynorhinus townsendii townsendii*) rather than the pale Townsend's big-eared bat (Piaggio and Perkins 2005). The bats recorded along the lower Colorado River will be referred to as pale Townsend's big-eared bats in this report, as the nomenclature change has not yet been verified by U.S. Fish and Wildlife Service.

4.2.1.2 Capture Surveys

Bats were captured with mist nets at the PVER 1 night per month from June to August 2017. One western red bat, one western yellow bat, and four California leaf-nosed bats were captured (Hill 2018).

4.2.2 Rodent Monitoring

Live trapping was conducted on October 12, 2016, to determine the presence of Colorado River cotton rats (*Sigmodon arizonae plenus).* One hundred traps were set on transects in Phases 4 and 8 for 1 night. Two Colorado River cotton rats and one desert pocket mouse (*Chaetodipus penicillatus*) were captured (Hill 2017).

The subspecies of the desert pocket mouse was not determined, but it is not expected to be of the *sobrinus* subspecies, as the PVER is south of the subspecies' documented range.

5.0 HABITAT CREATION CONSERVATION MEASURE ACCOMPLISHMENT

5.1 Vegetation Monitoring

Vegetation data were collected in FY17 using light detection and ranging (lidar). Lidar measures the vegetation structure throughout the canopy and provides the ability to identify structural diversity and successional growth stages. Conservation area vegetation will be evaluated on a periodic basis using lidar to ensure the habitat is meeting species' requirements. A procedure to analyze and provide vegetation structure metrics will be developed, and the results will be presented in future reports.

5.2 Evaluation of Conservation Area Habitat

The Final Habitat Creation Conservation Measure Accomplishment Tracking Process was finalized in October 2011 (LCR MSCP 2011). All areas within the PVER were designed to benefit covered species at the landscape level.

To meet species habitat creation requirements, the Habitat Conservation Plan provides goals for habitat creation based on land cover types. These land cover types are described using the Anderson and Ohmart vegetation classification system (Anderson et al. 1976, 1984a and 1984b). Thirteen species with habitat creation goals have creditable acres at the PVER. These species, including their corresponding conservation measure acronyms, are: southwestern willow flycatcher (WIFL1), western red bat (WRBA2), western yellow bat (WYBA3), Colorado River cotton rat (CRCR2), yellow-billed cuckoo (YBCU1), elf owl (*Micrathene whitneyi*) (ELOW1), gilded flicker (*Colaptes chrysoides*) (GIFL1), Gila woodpecker (*Melanerpes uropygialis*) (GIWO1), vermilion flycatcher (*Pyrocephalus rubinus*) (VEFL1), Arizona Bell's vireo (BEVI1), Sonoran yellow warbler (YWAR1), summer tanager (SUTA1), and MacNeill's sootywing skipper (*Pholisora gracielae = Hesperopsis gracielae* [MacNeill]) (MNSW2) (table 3).

Table 3.—Species-specific habitat creation conservation measure creditable total acres for 2017

Species-specific habitat creation conservation measure	WIFL1	WRBA2	WYBA3	CRCR2	YBCU1	ELOW1	GIFL1	GIWO1	VEFL1	BEVI1	YWAR1	SUTA1	MNSW2
Creditable acres in 2017	0	0	0	0	0	0	0	0	0	0	0	0	0
Total, including previous years	945	1,023	1,023	1,023	945	985	945	945	985	1,023	945	945	40

6.0 ADAPTIVE MANAGEMENT

Adaptive management relies on the initial receipt of new information, the analysis of that information, and the incorporation of the new information into the design and/or direction of future project work (LCR MSCP 2007). The Adaptive Management Program's role is to ensure habitat creation sites are biologically effective and fulfill the conservation measures outlined in the Habitat Conservation Plan for 26 covered species and if they potentially benefit 5 evaluation species. Post-development monitoring and species research results will be used to adaptively manage habitat creation sites after initial implementation. Once monitoring data are collected over a few years, and then analyzed for the PVER, recommendations may be made through the adaptive management process for site improvements in the future.

There are no adaptive management recommendations for the PVER at this time.

LITERATURE CITED

Anderson, B.W. and R.D. Ohmart. 1976. Vegetation Type Maps of the Lower Colorado River from Davis Dam to the Southerly International Boundary, Final Report. Bureau of Reclamation, Lower Colorado Region, Boulder City, Nevada.

_____. 1984a. Vegetation Management Study for the Enhancement of Wildlife Along the Lower Colorado River, Final Report. Bureau of Reclamation, Lower Colorado Region, Boulder City, Nevada.

_____. 1984b. Lower Colorado River Riparian Methods of Quantifying Vegetation Communities to Prepare Type Maps, Final Report. Bureau of Reclamation, Lower Colorado Region, Boulder City, Nevada.

Bureau of Reclamation (Reclamation). 2018. Colorado River Accounting and Water Use Report: Arizona, California, and Nevada, Calendar Year 2017. Bureau of Reclamation, Lower Colorado Region, Boulder City, Nevada.

Hill, J. 2017. Post-Development and System-Wide Monitoring of Rodent Populations, Fiscal Year 2017. Annual report prepared by the Lower Colorado River Multi-Species Conservation Program, Bureau of Reclamation, Boulder City, Nevada.

_____. 2018. Post-Development Bat Monitoring of Conservation Areas and the ‘Ahakhav Tribal Preserve Along the Lower Colorado River – 2016 and 2017 Capture Surveys. Annual report prepared by the Lower Colorado River Multi-Species Conservation Program, Bureau of Reclamation, Boulder City, Nevada.

Lower Colorado River Multi-Species Conservation Program (LCR MSCP). 2004. Lower Colorado River Multi-Species Conservation Program, Volume II: Habitat Conservation Plan, Final. December 17 (J&S 00450.00). Sacramento, California.

_____. 2007. Final Science Strategy. Bureau of Reclamation, Lower Colorado River Multi-Species Conservation Program, Lower Colorado Region, Boulder City, Nevada.

_____. 2010. Lower Colorado River Multi-Species Conservation Program Fire Management & Law Enforcement Strategy. Bureau of Reclamation, Boulder City, Nevada.

_____. 2011. Final Habitat Creation Conservation Measure Accomplishment Tracking Process. Lower Colorado River Multi-Species Conservation Program, Bureau of Reclamation, Lower Colorado Region, Boulder City, Nevada.

McLeod, M.A., S. Nichols, and A. Pellegrini. *In press*. Southwestern Willow Flycatcher Surveys, Demography, and Ecology Along the Lower Colorado River and Tributaries, 2017 Draft Annual Report. Submitted to the Lower Colorado River Multi-Species Conservation Program, Bureau of Reclamation, Boulder City, Nevada, by SWCA Environmental Consultants, Flagstaff, Arizona, under contract No. R13PD30017.

Mixan, R. and J.M. Diamond. *In press*. 2017 Post Development Acoustic Bat Monitoring of LCR MSCP Bat Species. Annual report submitted to the Bureau of Reclamation, Boulder City, Nevada, by the Arizona Game and Fish Department, Phoenix, Arizona.

Parametrix, Inc., and Southern Sierra Research Station. 2018. Yellow-billed Cuckoo Surveys on the Lower Colorado River, 2017 Draft Annual Report. Annual report submitted to the Lower Colorado River Multi-Species Conservation Program, Bureau of Reclamation, Boulder City, Nevada, by D. Tracy and S. E. McNeil, Southern Sierra Research Station, Weldon, California; and J. Lisignoli, Parametrix, Inc., Albuquerque, New Mexico, under contract No. R14PD0004.

Piaggio, A.J. and S.L. Perkins. 2005. Molecular phylogeny of North American long-eared bats (Vespertilionidae: *Corynorhinus*); inter- and intraspecific relationships inferred from mitochondrial and nuclear DNA sequences. Molecular Phylogenetics and Evolution 37:762–775.

SWCA Environmental Consultants. 2018. Riparian Bird Surveys at Conservation Areas in the Lower Colorado River Region, 2017. Submitted to the Lower Colorado River Multi-Species Conservation Program, Bureau of Reclamation, Boulder City, Nevada, by SWCA Environmental Consultants, Flagstaff, Arizona, under contract No. R17PC00026.